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(54) Title: FRANCISELLA STRAIN FOR LIVE VACCINE

(57) Abstract: A strain of *Francisella* species wherein a gene which encodes an enzyme in the purine pathway has been inactivated, and which is able to produce a protective immune response in an animal, for use as a live prophylactic or therapeutic vaccine against infection by said *Francisella* species. Suitable genes for inactivation include the *purF* gene. Pharmaceutical compositions and methods which utilise these strains are also described and claimed.

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# INTERNATIONAL SEARCH REPORT

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'GB2004/001264

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 7 A61K39/02 A61P31/04

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
IPC 7 A61K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, BIOSIS, EMBASE

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	KARLSSON J ET AL: "Sequencing of the Francisella tularensis strain Schu 4 genome reveals the shikimate and purine metabolic pathways, targets for the construction of a rationally attenuated auxotrophic vaccine" MICROBIAL AND COMPARATIVE GENOMICS, vol. 5, no. 1, 2000, pages 25-39, XP009018156 ISSN: 1090-6592 the whole document	1-3, 5-11, 13-18, 20-26
A	ELLIS J ET AL: "Tularemia" CLINICAL MICROBIOLOGY REVIEWS. OCT 2002, vol. 15, no. 4, October 2002 (2002-10), pages 631-646, XP002295463 ISSN: 0893-8512  ----- -/--	

☒ Further documents are listed in the continuation of box C.

☐ Patent family members are listed in annex.

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>TITBALL R W ET AL: "Will the enigma of Francisella tularensis virulence soon be solved?"</p> <p>TRENDS IN MICROBIOLOGY, vol. 11, no. 3, March 2003 (2003-03), pages 118-123, XP002295464 ISSN: 0966-842X</p>	
A	<p>GRAY C G ET AL: "The identification of five genetic loci of Francisella novicida associated with intracellular growth"</p> <p>FEMS MICROBIOLOGY LETTERS, vol. 215, no. 1, 24 September 2002 (2002-09-24), pages 53-56, XP002295465 ISSN: 0378-1097 cited in the application</p>	